



Docket No.: 44084-484

PATENT

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Application of : Customer Number: 20277  
Kazuyuki NISHI : Confirmation Number: 9990  
Serial No.: 09/752,524 : Group Art Unit: 1746  
Filed: January 03, 2001 : Examiner: KORNAKOV, Michael  
For: WASHING METHOD

**DECLARATION UNDER 37 C.F.R. 1.132**

Mail Stop AF - Declaration  
Honorable Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

*Do not enter  
M R  
05/03/04*

I, Kazuyuki NISHI, hereby declare and say as follows:

1. That I graduated from Department of Physics, School of Science, Kansei Gakuin University in March 1990, and since April 1990, I have been employed by Minolta Co., Ltd., now Konica Minolta Opto, Inc.
  
2. That I have been engaged in the research and development of thin film design, coating technology, lens processing technology, and washing methods.
  
3. That I (i) am the named and true inventor in the above-identified patent application, (ii) have read and am familiar with the pending Office Action in the above-

identified application and (ii) make this Declaration in support of the patentability of amended independent claim 1.

5. That the present invention, as discussed in the present specification, is based on a case where a solvent used in the pre-step of the washing step has been changed from tetrachloroethylene or methylene chloride to a petroleum-based hydrocarbon. Aliphatic compounds of petroleum-based hydrocarbons are suitable for washing, but pose a problem of not being capable of being emulsified by means of an emulsifier containing a detergent as the major constituent. I have found that when a washing step, making use of IPA or acetone that are able to dissolve a petroleum-based hydrocarbon, is introduced prior to a water-based washing step with an emulsifier, the efficiency of washing is significantly enhanced.

6. That petroleum-based hydrocarbons cleaners such as, for example, HC-FX70 (product of TOSOH Corporation) and SD3 (product of Idemitsu Kosan Co., Ltd., which are common washings used to wash optical components and various parts, are not emulsified by means of an emulsifier at all, while, on the other hand, washing petroleum-based hydrocarbons are completely dissolved in IPA or acetone.

7. That the above is proved by the following experiments that were conducted at my direction and under my supervision, and the test results are true and correct to the best of my knowledge.

## Comparative Experiments

### **(1) An experiment for emulsifying a petroleum-based hydrocarbon with an emulsifier**

- A solution containing 1 % by volume emulsifier was mixed in a test tube with a solution containing 10% by volume petroleum-based hydrocarbon.
- HC-FX70 (product of TOSOH Corporation) or SD3 (product of Idemitsu Kosan Co., Ltd.) was used as a petroleum-based hydrocarbon.
- After the resultant mixture was agitated for 5 minutes using a supersonic wave of 28 kHz and 600 W, the resulting solution was left to stand for 30 minutes and then the degree of emulsification was visually observed.
- As a result, emulsification was not confirmed for both HC-FX70 and SD3 (water and the hydrocarbons were completely separated.).
- Moreover, even though the concentration of the emulsifier was increased to 5%, the emulsification did not occur.

### **(2) Dissolution experiments of petroleum-based hydrocarbons using IPA**

- An IPA stock solution was mixed in a test tube with a solution containing 10% by volume petroleum-based hydrocarbon.
- HC-FX70 (product of TOSOH Corporation) or SD3 (product of Idemitsu Kosan Co., Ltd. was used as a petroleum-based hydrocarbon.
- After the resultant mixture was agitated for 5 minutes using a supersonic wave of 28 kHz and 600 W, the resulting solution was left to stand for 30 minutes and then the degree of emulsification was visually observed.
- As a result, both HC-FX70 and SD3 were completely dissolved.

**(3) Dissolution experiments of petroleum-based hydrocarbons with acetone**

- An acetone stock solution was mixed in a test tube with a solution containing 10% by volume petroleum-based hydrocarbon.
- HC- FX70 (product of TOSOH Corporation) or SD3 (product of Idemitsu Kosan Co., Ltd. was used as a petroleum-based hydrocarbon.
- After the resultant mixture was agitated for 5 minutes using a supersonic wave of 28 kHz and 600 W, the resulting solution was left to stand for 30 minutes and then the degree of emulsification was visually observed.
- As a result, both HC- FX70 and SD3 were completely dissolved.

**Conclusion**

In my opinion, the test results demonstrate that:

- (i) The experiment (1) does not lead to adequate cleaning on account of the mixing of the hydrocarbon into an aqueous washing solution (emulsifier solution) even though water-based washing was carried out subsequent to a washing step using a hydrocarbon. The reason for this is that the aqueous washing solution (with the emulsifier added) is significantly contaminated by the abundance of the hydrocarbon that was introduced into the aqueous washing solution.
- (ii) From the test results of experiment (2) and experiment (3), the conducting of water-based washing after an intermediate washing step using IPA or acetone results in adequate cleaning because a hydrocarbon is rarely mixed into the aqueous washing solution. Consequently, the aqueous washing solution withstands longer use by a factor of 15 or more.

I declare further that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

April 15, 2004  
Date

Kazuyuki Nishi  
Kazuyuki NISHI